Improving Safe Consumer Transfers in a Day Treatment Setting Using Training and Feedback

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ABSTRACT

An intervention package that included employee training, supervisory feedback, and graphic feedback was developed to increase employees' safe patient-transfers at a day treatment center for adults with disabilities. The intervention was developed based on the center's results from a Performance Diagnostic Checklist (PDC), which focused on antecedents, equipment and processes, knowledge and skills, and consequences related to patient-transfers. A multiple baseline (MBL) across two lifts (pivot and trunk), with one lift (side) remaining in baseline was used to evaluate the effects of the treatment package on three lifts commonly used by three health-care workers. The results indicated a substantial increase in the overall safe performance of the three lifts. The mean increase for group safety performance following intervention was 34% and 29% over baseline measures for the two target transfers, and 28% over baseline measures for the nontargeted transfer. The implications of these findings suggest that in settings where patient transfers are frequent and injuries are likely to occur (e.g., hospitals, day treatment centers), safe lifting and transferring behaviors can improve with an efficient and cost-effective intervention.

Keywords: back safety, feedback, generalization, human services, organizational behavior, Performance Diagnostic Checklist, training

According to the Bureau of Labor Statistics (2009a), 3.7 million nonfatal occupational injuries and illnesses were reported in private industries in 2008, which translates to 3.9 cases per 100 full-time workers. A staggering 1.9 million involved lost workday cases, which required recuperation and/or restricted duties on-the-job. In that same year, health services reported roughly 660,200 work-related injuries and illnesses, which translates to 5.4 cases per 100 full-time workers. Within health services, nursing and residential care facilities rank the second highest in occupational injuries and illnesses and the highest with injuries and illnesses resulting in days away from work, job transfer, and/or restriction. In 2008, nursing and residential care facilities reported an incidence rate of 8.4 cases per 100 full-time workers, totaling approximately 200,400 injuries and illnesses. Moreover, nursing and personal care facility workers reported roughly 16,250 back injuries wherein roughly half of those injuries were caused by overexertion in lifting (Bureau of Labor Statistics, 2009b).

One scientific approach that has yielded particular success with changing caregiver lifting and reducing lift-related injuries is the behavioral approach. The behavioral approach offers low-tech solutions directed at encouraging performers to engage in safer work behavior. Sulzer-Azaroff and Austin (2000) describe the basic elements of the behavioral approach as: (a) identifying behaviors that impact safety; (b) defining those behaviors precisely enough to measure them reliably; (c) developing and implementing mechanisms for measuring those behaviors in order to determine their current status and set reasonable goals; (d) providing feedback; and (e) reinforcing progress with those behaviors.

The behavioral approach has previously been employed to increase safe behavior in a wide variety of workplace settings such as food manufacturing (Komaki, Barwick, & Scott, 1978), industrial settings (Chhokar & Wallin, 1984), electronic firms (Streff, Kalsher, & Geller, 1993), and human service settings (Alavosius & Sulzer-Azaroff, 1986; 1990), among others. For example, Alavosius and Sulzer-Azaroff used an observation system in which patient lifting techniques were assessed on-the-job and two patient-transfer techniques were task analyzed into detailed sequences of steps. The researchers found the observation system to be a reliable method for assessing employees' transfer techniques,

and improvements in transfer behavior were observed during various feedback schedules. Nielsen, Sigurdsson, and Austin (2009) used video scoring and feedback to improve nurses' safety behavior during one-person transfers at a rural acute care hospital. An on-the-job assessment of patient lifting techniques was used to determine 18 steps for wheelchair-to-standing lifts and 17 steps for standing-to-wheelchair lifts. Participants included 6 nurses who received information on standing and sitting lift transfers; 2 participants also received feedback on their transfer behavior. Results indicated greater safety improvements during the feedback phase; however, those improvements did not sustain beyond the intervention phase.

To impact safety-related organizational performance, the initial step must involve identifying work behaviors leading to injury and developing a measurement system for recording those behaviors. After reliable measures of behavior are collected, the related causes for the observed deficits should be identified. The identification of behavioral and environmental deficits can be facilitated by the use of performance diagnostic methodology. For example, Shier, Rae, and Austin (2003) used a Performance Diagnostic Checklist (PDC) to suggest the potential causes of ineffective cleaning routines of grocery store employees. The informal assessment focused on antecedents, equipment and processes, knowledge and skills, and consequences as the possible contributing factors involved in substandard performance. Researchers analyzed each area of focus through direct observations and by interviewing managers and employees involved in the work-tasks. The results of the PDC were used to guide the development of an intervention that ultimately resulted in considerable behavior change for the store's cleaning routines.

The purpose of the current study was to administer the PDC during the developmental phases of an intervention addressing unsafe lifting techniques at a nursing care facility. The results of the PDC revealed the need for a solution that combined employee safety training and supervisory verbal and graphic feedback. Performance on topographically similar lifting techniques was also monitored to assess generalization effects.

Method

Participants

Participants in this study were 3 employees (2 female, 1 male) and their supervisor (male), who was also the center's director, at a day treatment center for adults with disabilities. The participants in this study were the only 3 individuals who worked at the center. The 3 employees' lifting and transferring behavior was targeted for change and the supervisor acted as the change agent. The employees' ages ranged from 24–44 years, and their duration of employment ranged from 2–10 years.

Setting

The setting was a treatment center for adults with disabilities located in a partial patient treatment facility on the campus of a Midwestern university. The center provided services for consumers and their families where supervision was provided all day to help improve the adult's social interaction and learning, to prevent, delay, or slow the effects of age-related problems, and to provide health and rehabilitation activities. There were approximately 25 consumers at the treatment center, yielding an employee to consumer ratio of approximately 1:8. All consumers were adults with severe cognitive and physical handicaps and most had moderate to low language skills. The site was selected by the university's Injury Prevention Team, a group of occupational therapists, physical therapists, and other safety experts, because of its high number of work-related injuries.

The observation area included one large common area, connected by a hallway to a small dining area and several bathrooms. The common area contained reclining and rocking chairs, swings, and tilt and transport tables. In the common area room, employees assisted consumers with exercising, performing hygienic duties, and participating in games. Research assistants videotaped lifting without disturbing daily routines. Videotapes were scored at a later time.

Injury Analysis

Injury records from the two years prior to the study were analyzed to identify behavior in need of improvement. The analysis revealed that the most frequent employee injuries resulted from patient lifting or transferring a patient from/to a surface. These injuries included strains to the back, neck, shoulders, and ankles. A total of 14 lifting/transferring injuries occurred in the two years prior to the study. Given that only 3 employees worked at the facility, an average of 7 injury cases per 3 full-time employees each year is a much higher incident rate than the national average, which was 8.4 injury cases per 100 full-time workers at nursing and residential care facilities (BLS, 2009b).

Performance Diagnostic Checklist

To identify safety targets and develop optimal intervention strategies, an assessment of lifting behavior and the workplace environment was conducted. Assessment data were collected through direct observation and interviews with occupational therapists guided by the use of the PDC (Austin, 2000). One item on the PDC is equipment and processes, which involves identifying obstacles that keep the employee from completing the task. Sample questions include: Is the equipment located in an easily accessible location? Is the equipment located in another room decreasing the likelihood the employee will search for the equipment, transfer it to the patient's location, and use the equipment? Direct observations involve walking through the day treatment facility to examine and determine which areas of the PDC were being fulfilled or lacking and therefore, in need of intervention. Direct observations also involved on-the-job observation and evaluation of employee lifting techniques including the types of lifts used and their frequency, the percentage of lifts completed safely, and the surfaces to and

from which employees were lifting and transferring consumers. Interviews with the day treatment's occupational therapists were conducted to gather information on the PDC areas that went unanswered during direct observations and to further support the PDC areas that were answered during direct observation.

PDC Results

Overall, the PDC revealed that the antecedents, equipment and processes, knowledge and skills, and consequences did not support safe lifting practices and, in some cases, hindered safety. The PDC results from the center's assessment are detailed below.

Antecedents. Few antecedent measures were exercised at the site to ensure safe lifting practices. Demonstration of proper lifting protocols typically occurred once for each employee and protocols were not presented to employees in written form. No instructions or prompts were delivered to specify when to use specific lifting protocols.

Equipment and processes. During the baseline observations, the common area room was often cluttered with equipment (e.g., wheelchairs, mats). The use of mechanical lifts (hoyers) and gait belts was infrequent, but the equipment was available for use. In addition to a high employee-to-consumer ratio, there were few breaks for employees.

Knowledge and skills. It was observed that transfer protocols changed frequently and that employees were not able to demonstrate safe transfers under all conditions. This suggested that performance deficiencies were due to knowledge, skill, or capacity deficits.

Consequences. Informal observations suggested that the supervisor provided little or no supervision of consumer lifting. Employees reported that the physical consequences of unsafe

lifting were soreness or injuries, but that these consequences were delayed and improbable.

PDC treatment recommendations. An intervention package was developed to address some of the deficiencies detected by the PDC assessment. Based on the PDC, recommendations were made to improve antecedents, equipment and processes, knowledge and skills, and consequences, however, not all recommendations were followed by the center. Below are the recommendations the center adopted to improve lifts and transfers.

To address shortcomings in antecedents, it was suggested that occupational therapists and physical therapists transcribe the lifting protocols and rules for safe lifting procedures. More specifically, the researchers consulted with the occupational therapists to identify the most frequent lifts, review current lifting protocols, discuss and agree on transfer protocols that are safe for both the consumer and the employee, and lastly, discuss a task analysis of safe transfers. This analysis involved breaking down each lifting transfer protocol (pivot, side-to-side, and trunk leg) into the smallest behavioral components. Based on these rules and behavioral components, checklists were developed for three lifting protocols. (For the three checklists, see Appendix A.)

To address skill and knowledge deficits, it was suggested that employees be trained on safe lifting procedures. To address the apparent lack of consequences, it was suggested that consumer lifting be supervised by way of employee self-report, peer evaluations, or managerial supervision. Last, it was recommended that a feedback system be arranged for the employees.

Dependent Variables

The dependent variable in this study was employee safety performance while carrying out the three most frequent consumer transfers (pivot, trunk-leg, and side-to-side). Checklists for each lift were designed to pinpoint the complex series of behaviors involved in safely lifting and transferring consumers. Each checklist included three sections: pre-lift, lift, and sit down of the consumer; and each section provided step-by-step instructions for the correct lifting procedure. The number of items on the checklists ranged from 19 to 22. There was considerable overlap in checklist items, as the three lifts included many of the same responses.

Independent Variables

The intervention package for this study included: (a) 1-hr employee training session on safe lifting with pivot transfer, (b) 1-hr supervisory training session in the use of the checklist to observe employees and in the delivery of effective verbal feedback, (c) posting weekly graphic feedback, and (d) delivering daily verbal feedback by the supervisor.

Procedure

Data collection procedures. Two trained undergraduate students served as observers and a trained graduate student conducted reliability observations. Observers were trained in the use of the safety checklist by viewing videotapes of the employees performing the three targeted lifts. When scoring the lifts, each checklist component was marked as either "safe" or "at-risk." A given component of a lift was marked as "safe" if it matched the protocol defined by the checklist. When the observed component was not consistent with the protocol, it was marked as "at-risk."

Following observer training, research assistants collected data by videotaping staff-consumer transfers three to four times a week for 1–2 hr per observation. Observations were conducted in the morning and afternoon at peak transfer times. A total of 107 observation sessions were conducted over the course of 8 months, and a total of 259 lifts were scored.

Interobserver agreement. Interobserver agreement (IOA) was scored for 18% of the observation sessions with observations distributed evenly across the last 3 phases. Throughout the study, overall agreement for all lifts averaged 89% (range, 57% to 100%). Interobserver agreement for each lift throughout the study averaged: 87% (range, 64% to 100%) for pivot lift, 91% (range, 63% to 100%) for trunk-leg lift, and 82% (range, 57% to 100%) for side-to-side lift. Interobserver agreement was

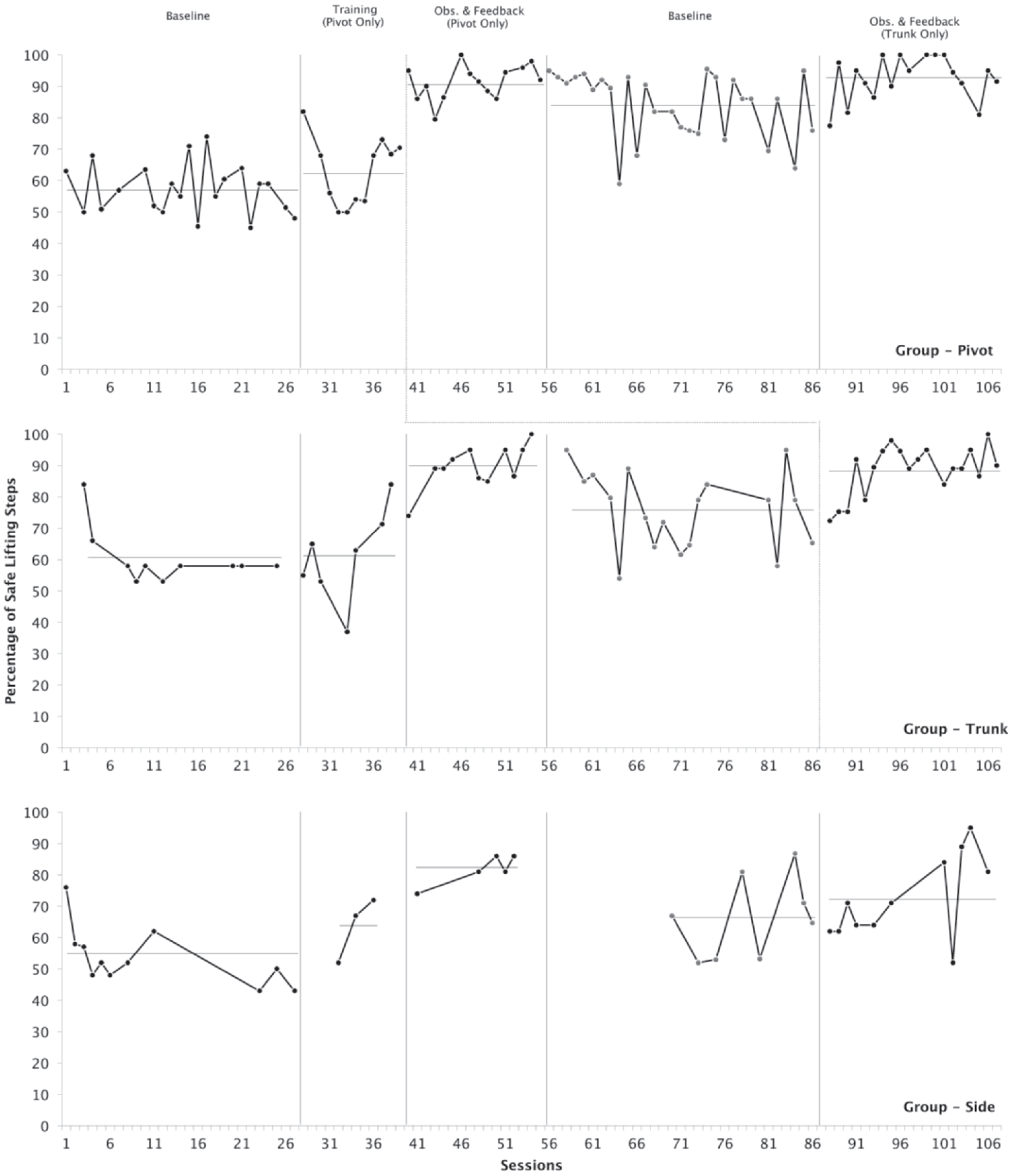

Figure 1. Overall percentage of lifting steps performed safely across three lifts by all participants. Training only occurred once during the training phase, as noted by the arrow pointing to one session. Horizontal lines represent condition means.

calculated for each lift and experimental phase by using the point-by-point agreement method and the standard formula of the number of agreements divided by number of agreements plus disagreements, multiplied by 100.

Baseline. Baseline measures of the three lifts were carried out for 27 observations (days). During baseline, no changes were made to the physical environment, and employees received no information on their safety while performing lifts on-the-job.

Training. Employees attended a training session on the pivot lift transfer on day 28. All three employees and their supervisor attended one training session. During training, staff members were taught key features of the checklist for safe lifting, provided with task clarification of the pivot lift protocol, provided with guided practice and observation, and provided with demonstrations of the pivot lift only (for the handout of training agenda given to the implementation team; see Appendix B). The pivot lift was targeted first, as baseline observations suggested that pivot lifts were performed most frequently and provided clear opportunity for improvement. The supervisor privately received additional training on how to conduct observations of lifts, how to deliver positive and corrective feedback, and the construction and use of group performance graphs. Note that during the training phase, training only occurred during session 28. Therefore, sessions 29–39 were conducted exactly the same as baseline sessions.

Observation and feedback. Supervisory verbal and posted graphic feedback was introduced for the pivot lift on day 40. The supervisor observed each employee's safety performance periodically throughout the day and provided positive and corrective verbal feedback after each observed lift. The supervisor conducted approximately three to five observations per week for each employee. The supervisor was advised to graph and post the group's mean performance on the pivot lift at the end of each week. The same procedures were introduced later in the study when feedback was provided for the trunk-leg transfers.

Experimental Design

A reversal design was used to demonstrate experimental control of our intervention on pivot lift transfers. The generalized effects of our intervention was assessed on trunk and side lift transfers.

Results

Results are summarized for each lift at the level of the group (Figure 1; individual performance graphs are available from the authors upon request). Because the performance of all 3 participants was averaged for each of the targeted lifts, when posted, Figure 1 also represents data presented to the participants when feedback was arranged.

Pivot lift. During baseline, the mean safe performance for the pivot lift across all participants was 57%. Following the pivot training session, the mean increased slightly. When supervisor observation, verbal and graphic feedback targeting the pivot transfer was arranged, the mean safety performance increased 34% over baseline. Upon return to baseline, observation and feedback for the pivot lift stopped, and the safety percentage for pivot lift performance decreased by 7%. During the final experimental phase, in which the treatment was applied to trunk-leg lift transfers, safe performance for pivot lifts increased. All individual performances with respect to pivot lift transfers improved from baseline to treatment (improvement range: 29% to 45%).

Trunk-leg lift. During the baseline period, the mean safe performance for the trunk-leg lift across all participants was 60%. When observation and feedback was arranged for the pivot lift, the mean safe performance for the trunk-leg lift increased 29% over baseline, suggesting that the effects of training pivot lift transfers generalized to trunk-leg lifts. Control of the apparent generalization was shown when performance worsened during the return to baseline. During the final intervention phase when supervisory observation and feedback was delivered for the trunk-leg lift, the mean safe performance for the trunk-leg lift increased 28%. All individual performances with respect to trunk-leg lift transfers improved from baseline to treatment.

Side-to-side lift. There was no supervisory or graphic feedback delivered to employees regarding their performance on the side-to-side lift at any point during the study. During baseline, the mean safe performance for the side-to-side transfer across all participants was 54%. During feedback for the pivot lift, safe performance increased 28% over baseline. When pivot lift feedback was removed, mean safe performance decreased nearly 16% and then increased 6% when treatment was reimplemented. Similar performance changes were observed across individuals.

Discussion

Safe performance of the two targeted lifts (pivot and trunk-leg) appeared to increase as a result of supervisor observation and delivery of verbal and graphic feedback. When employees were observed and provided feedback on their safe lifting, the safety percentage for pivot lifting increased considerably over baseline, as did the safety percentage for trunk-leg lift. These findings replicate the results demonstrated by Alavosius and Sulzer-Azaroff (1986, 1990) and Nielson et al. (2009) who found that feedback on patient transfers increased the safe performance of health-care employees.

Employees did not receive feedback on the side-to-side lift at any point during the study, however, when feedback was directed to the pivot and trunk-leg lifts, data indicate that safe performance of the side-to-side lift increased as well. Similar improvements were observed for trunk-leg lifts when observation and feedback was arranged only for pivot lifts. These results demonstrated the generalized effects of our intervention.

It is possible that feedback, provided for correct execution of the pivot lift, may have functioned as reinforcement for similar responses during nontarget lifts. At the same time, it is also possible that improvements were observed in nontarget lifts due to some overlap in the behavioral components of the

three lifts. A total of 11 behavioral components were identical or similar among the three lifts.

The generalization of treatment effects is a fundamental concern in applied behavior analysis because "if an intervention has positive effects on the target behavior, and it also has positive effects on other related behaviors, an efficient intervention has been designed. This affords the practitioner the change of multiple behaviors 'for the price of one'" (Austin & Wilson, 2001, p. 40). Houchins and Boyce (2001) concur noting that when improvements are demonstrated with nontargeted behavior while intervening on only one targeted behavior, an intervention of greater efficiency has been designed at lower costs than intervening separately on all the behaviors.

It is also interesting to note that employees were trained specifically on the pivot lift only, and did not receive any instruction on how to perform the trunk-leg or side-to-side lifts. Without training on the trunk-leg and side-to-side transfers, employees performed these lifts safely over the course of the study. This suggests that perhaps training was not a necessary intervention component, and/or that observation and feedback served an instrumental role.

The use of the PDC in the current study replicates Shier et al. (2003), which focused on antecedents, equipment and processes, knowledge and skills, and consequences. The diagnosis of lifting behaviors also facilitated the development of an effective intervention package. As a result of the PDC, shortcomings in antecedents, and knowledge and skills of the employees were identified. Consequently, each lift was operationally defined and employees were trained on the transfer that occurred most frequently during baseline. The PDC also indicated a lack of consequences for the target behaviors, which the intervention package addressed by including supervisory, verbal, and graphic feedback. The identified equipment and process issues did not result in any changes to the site.

Possible limitations of this study include a lack of independent variable integrity. Although the independent variable demonstrated repeated effects across the two targeted patient transfers, formal independent variable integrity measures were not carried out. In order to more accurately assess the independent variable integrity, a formal feedback tracking system would have been beneficial (refer to Vollmer, Sloman, & Pipkin, 2008, for treatment integrity suggestions). Such a system could also have functioned as performance support for the supervisor. Furthermore, the study could also have benefited from a more comprehensive response to problems identified via the PDC. Some of the recommendations suggested to address equipment and process concerns were not adopted by the center (e.g., equipment rearrangement, and training in the use of transferring equipment). Additionally, the center did not follow suggestions to address concerns pertaining to the lack of rewarding consequences delivered to employees. It was suggested that immediate, probable, and sizable consequences be arranged for safe lifting, which means selecting large, positive consequences that employees are certain they will receive a short time after engaging in the target behavior. Lastly, although participants were trained on the conditions under which a pivot lift should be used, data were not collected on participants' accuracy with choosing the correct lift. For example, if a participant used a pivot lift, when instead a side-to-side lift should have been used, but performed each step of the pivot lift correctly, the participant's pivot lift steps were scored as correct. In other words, participants were scored as safe if they did each step correctly, regardless of whether or not they selected the wrong lift given the lift conditions.

In conclusion, the current study demonstrated a behavioral approach to improving patient-transferring techniques. The task analyses of each lift and consultation with an occupational therapist were vital in the development of the observational checklist, while management involvement was probably important to the success of the intervention. Alvero, Bucklin, and Austin (2001) have found that delivery of feedback from a supervisor to be the most effective feedback source. In the current study, the primary reason for using supervisor-delivered feedback was to aid in the implementation of the safety program, which often improves employee buy-in with a new safety program and their subsequent participation.

Guide for Practitioners

Practitioners interested in designing future interventions to target unsafe patient-transfer behaviors may want to consider potential similarities in topographies across lifts. If the behaviors involved in the lifts share similarities or produce similar consequences, an intervention may be designed to target only one lift. This type of intervention could greatly benefit settings (e.g., hospitals, nursing homes) for which patient transferring is frequent and injuries are likely to occur, and may be more cost-effective for those dealing with resource and budget constraints.

Additionally, practitioners can follow a few important guidelines for developing their own safety intervention system specific to the existing behavioral and environmental concerns. The following steps will aid in developing and implementing a safety process.

1. Develop an observation checklist based on a PDC assessment, analysis of injury reports, and speculation of causes.
2. Pilot the observation checklist by practicing. Observe employees' behavior and note the difficulties in observing and/or recording; for example, note the time it takes to complete the checklist, clarity of the behavioral definitions, and items that were not included.
3. Arrange the data collection system by training managers or employees to conduct reliable safety observations. That is, managers and employees can accurately, and consistently, score behavior as trained.
4. Regularly graph and review safety data collected from observations to assess trends in behavior, provide positive feedback on performance, and monitor the success of the intervention. Daily graphing and weekly review is recommended, and often preferred by management.

5. Analyze at-risk behavior and correct that at-risk behavior through an analysis of environmental antecedents and consequences for the at-risk behavior. The ABC analysis (Antecedent - Behavior - Consequence) and PIC/NIC analysis (Positive Immediate Consequence - Negative Immediate Consequence) are helpful tools for identifying antecedents and consequences (for more information see Daniels & Daniels, 2006).
6. Intervene based on the results of the analyses. For example, the PIC/NIC involves examining consequences according to positive or negative consequences that are immediately received by the individual, and the certainty with which the individual will receive that consequence.
7. Track progress continually by celebrating and recognizing employees' improvements by delivering praise and rewards that employees have communicated they would enjoy receiving.

Furthermore, it is beneficial to devise a safety process that is employee driven. Involve employees in the development phase of the safety process through focus groups in order to gain information about tasks, behavior, and the workplace environment. Employee involvement increases the likelihood that employees will cooperate with the process and participate in the intervention, thus increasing the likelihood that the safety process will be successful. Lastly, it is imperative that practitioners avoid punitive statements or publically deliver corrective feedback in front of other employees; such behavior increases the risk of creating a hostile work environment where employees feel management is not supportive and therefore, the safety process is not worth their time or effort.

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Pivot Transfer	Employees:	J C M S	J C M S	J C M S
Pre-lift		1	2	3
1.Position wheelchair at a 45 degree angle.		C AR	C AR	C AR
2.Lock breaks and remove footrests.		C AR	C AR	C AR
3.Prepare the new surface.		C AR	C AR	C AR
4.Sit the consumer up, feet are touching the ground.		C AR	C AR	C AR
5.Apply the gait belt.		C AR	C AR	C AR
6.Squat, bending at the knees in front of the consumer.		C AR	C AR	C AR
7.Feet wide apart, more than shoulder width,		C AR	C AR	C AR
with one foot facing the original surface		C AR	C AR	C AR
and the other towards the new surface.		C AR	C AR	C AR
8.Bend at the hips to lean forward.		C AR	C AR	C AR
9.Head up.		C AR	C AR	C AR
10.Slide the consumer to the edge of surface.		C AR	C AR	C AR
11.Position consumer's feet flat on the floor.		C AR	C AR	C AR
Lift				
12.Instruct the consumer to stand, shifting weight back,		C AR	C AR	C AR
lifting the consumer to a semi-standing position.				
Knees slightly bent and shoulders above your waist,		C AR	C AR	C AR
shift weight towards the new surface (pivot).		C AR	C AR	C AR
Torso is still, no twisting at the waist.		C AR	C AR	C AR
Sit down				
13.Instruct the consumer to sit down.		C AR	C AR	C AR
14.Head up.		C AR	C AR	C AR
15.Lower the consumer slowly,		C AR	C AR	C AR
bending at the hips and knees. WIDE STANCE		C AR	C AR	C AR
16. Position the consumer.		C AR	C AR	C AR
	Total	_____	_____	_____

% of 22

Trunk-Leg Lift	Employees:	J C M S	J C M S	J C M S
Pre-lift		1	2	3
1.Position wheelchair parallel to surface (=)		C AR	C AR	C AR
2.Lock breaks and remove footrests.		C AR	C AR	C AR
3.Prepare the new surface.		C AR	C AR	C AR
4.Remove armrests and swing away scoli pads.		C AR	C AR	C AR
5.The first lifter squats in back of the consumer,		C AR	C AR	C AR
grasping under arms.				
6.Feet wide apart, more than shoulder width,		C AR	C AR	C AR
bending at the hips and knees.		C AR	C AR	C AR
7.The second lifter squats in front of the consumer,				
grasping under the thighs or thighs and hips.		C AR	C AR	C AR
8.Feet wide apart, more than shoulder width,		C AR	C AR	C AR
bending at the hips and knees.		C AR	C AR	C AR
9.Both lifters heads should be up.		C AR	C AR	C AR
Lift				
10.Count 1-2-3 and lift the consumer up on 3		C AR	C AR	C AR
staying close to the consumer,		C AR	C AR	C AR
keeping knees slightly bent and shoulders above waist,		C AR	C AR	C AR
11.Walk slowly to the new surface.				
Torso is still, no twisting.		C AR	C AR	C AR
Sit down				
12.Together lower the consumer to the new surface slowly,		C AR	C AR	C AR
bending at the hips and knees. WIDE STANCE		C AR	C AR	C AR
Heads up.		C AR	C AR	C AR
13.Position the consumer.		C AR	C AR	C AR
	Total	_____	_____	_____

% of 19

Side-to-Side Lift	Employees:	J C M S	J C M S	J C M S
Pre-lift		1	2	3
1.Position wheelchair perpendicular to the surface (L).		C AR	C AR	C AR
2.Lock breaks and remove footrests.		C AR	C AR	C AR
3.Prepare the new surface.		C AR	C AR	C AR
4.Move the consumer to the edge of the surface.		C AR	C AR	C AR
5.Apply the gait belt.		C AR	C AR	C AR
6.The first lifter, facing the consumer's side		C AR	C AR	C AR
positions one hand under the consumers back on gait belt,		C AR	C AR	C AR
and the other hand under the consumer's thigh near the knee		C AR	C AR	C AR
7.The second lifter assumes the same position, opposite side		C AR	C AR	C AR
crossing arms with the first lifter under the consumer's trunk		C AR	C AR	C AR
8.Both lifters are standing close to the consumer,		C AR	C AR	C AR
and bending at the hips and knees. WIDE STANCE.		C AR	C AR	C AR
Heads up.		C AR	C AR	C AR
Lift				
9.Count 1-2-3 and lift the consumer up on 3		C AR	C AR	C AR
keeping knees slightly bent and shoulders above waist,		C AR	C AR	C AR
10.Walk slowly to the new surface, staying close to the cons				
until the consumer is directly over the new surface. Trunk is		C AR	C AR	C AR
Continue to face the consumer's side. No twisting at the wai		C AR	C AR	C AR
Sit down				
11.Together lower the consumer to the new surface slowly,		C AR	C AR	C AR
bending at the hips and knees. WIDE STANCE		C AR	C AR	C AR
Heads up.		C AR	C AR	C AR
12.Position the consumer away from the edge of the surface		C AR	C AR	C AR
	Total	_____	_____	_____

% of 21

Appendix A. Checklists used to score the three lifts performed by staff participants.

Dear Implementation Team,

The following is an outline of how the training session will run. The idea behind this outline is to help the three of us [lead researcher, manager, occupational therapist] coordinate our efforts and give the appearance of mutual support for this program. In other words, this should help us to be on the same page. It is really important that employees see this as an organized and well thought out process.

Phase 1: Training Session:
Agenda (based on the Performance Based Instruction and the BBS process)

Introduction by the Manager
The manager will briefly introduce the project, discussing the Injury Prevention Group's decision to pilot the university-wide safety initiative. The manager will conclude with a statement of support for the project and will explain the benefits of participating in the program.

> ***Goal 1 –*** *It is really important to have the manager's support and to clearly express the importance of the program. [Without such support, employees are less likely to buy-in to the process and participate]*

Employee Safety and Checklist Compliance
The lead researcher will present the checklist to the employees and briefly cover the analysis that was involved with the construction of the checklist. The lead researcher will then briefly run through the arrangement of the checklist, highlighting the key features, and then conclude with a statement on how the checklist will be used and the importance of cooperation [by the employees].

> ***Goal 2 –*** *It is important that the employees have faith in the checklist and understand how the checklist relates to decreasing injuries.*
>
> ***Goal 3 –*** *Employees should have a clear understanding of how to fill out the checklist.*

Task Clarification: Walking through the checklist
The lead researcher will go through the pivot lifting protocol and will review the operational definition for each of the steps. The occupational therapist and the lead researcher will demonstrate any discrepancies between the checklist and what the employees were originally trained on as they come up.

> ***Goal 4 –*** *(Here is our goal to clearly review each of the steps within the pivot lifting protocol). This will be the most difficult part. It is important that the lead researcher and the occupational therapist are in complete agreement on the procedures included on the checklist. Any objections can be addressed after the initial implementation. We want to emphasize how following these procedures will protect the employees.*

Guided Practice: By the lead researcher and the occupational therapist
The employees will view the videotape from previous observations. First, the lead researcher will discuss what we are looking at, walking through the checklist. Second, everyone will score the lift on the video using the checklist. Third, everyone will discuss what was scored and why.

> ***Goal 5 –*** *It is important that the manager, the occupational therapist, and the lead researcher agree on scoring the lifting transfer and are able to explain the rationale to the employees.*

Implementation of the Checklist

a. Observations
   i. Primary observers:
      1. The manager and
      2. The occupational therapist
   ii. Description:
      1. During an observation session the manager will score pivot lifts that occur in that time using the checklist.
      2. Following the observation the manager will provide immediate individual feedback by showing the observed employee the completed checklist (% correct)
   iii. Frequency
      1. The observation sessions will occur twice daily, for ten minutes; once in the morning between 9-10 and once in the afternoon from 1-2. The observation times were chosen as the most likely times to view lifts
      2. Observations will be conducted on average 3 out of 5 days each week.
   iv. Probes
      1. Once every week the manager will observe lifting at a time not within the usual schedule to demonstrate whether the behavior is different over time.

b. At the end of the day, the manager will graph the percent correct observed for the group on each of the three lifts during each observation session.

Phase 2: Observation and Feedback on Pivots
The manager will only observe and give feedback on the pivot lifts demonstrated during an observation session. The manager will also mark performance on a group graph based on the average group performance. Occurring for approximately 2-3 weeks depending on the number of observations conducted.

Phase 3: Withdrawl of Feedback
The manager will take away feedback. Still conducting observations using the checklists but will not give employees any feedback. All prompts and graphs will be taken down. Occurring 2-3 weeks depending on the number of observations and data trends.

Appendix B: Training agenda provided to the implementation team prior to training employees in the pivot lift.